

	Diesel Stations						Acceptable Range	
Most Relevant Indicators	MSA		PRIT	CSA	TMF	Emulsion Plant	Min	Max
Sulphur (S) mg/kg	7.4		3.5	3.8	4.8	4.1	-	15
Flash point (PM) procedure A °C	61		63	62	63	63	60	-
Distillation at 90% Recovered °C	324.6		323.2	324.3	322.6	325.4	282	338
Cetane Index	49.3		50.4	50.1	49.6	49.8	45	-
Water and Sediments vol %	0.01		0.01	0.01	0.01	0.01	-	0.05
Lubricity est at 60 °C µm	480		460	450	490	460	-	520
Particle Count	ISO 4406		-	-	-	-	Contaminant code	
Contaminant Code 4 / 6 / 14 Microns	19	16	13	-	-	-	18/16/13	

- **Sulphur (S):** Environmental regulations and new technologies in engines that require it.; The less contained is the better in quality and environment protection.
- **Flash Point:** Regulation for transfer, transport operation (volatility).
- **Distillation:** indirectly tells us about the composition of how volatile the product is, because it affects its behavior in the engine tank. The volatility characteristics of a diesel have a great influence on the performance of diesel engines:
If the volatility is low, then high distillation end points are obtained, which are indicative of high combustion times and poor combustion of heavy hydrocarbons. This will lead to the formation of smoke, loss of power and increased fuel consumption.
If the volatility is high, then the fuel can cause incidents of 'vapour lock' in the lines.
- **Cetane:** is linked to the quality of the product, the higher the better, the less results in black smoke from the exhaust.
- **Water and Sediments:** water is a pollutant and if there is water there is corrosion and bacteria could grow in the storage tank and the calorific value of the product decreases.
- **Lubricity:** this characteristic is related to the lubricating property of diesel; the maximum is 520. The higher the number, the less lubricity the diesel has. The lower the value, the better lubricity which avoids so many scratches in the injectors.
- **Particle Count:** the filters of the truck's injection system can be covered; it guarantees the cleanliness of the fuel.

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Attention of : Ms. R. Rodriguez
Your reference : Monthly Inventory - April 2022 - Sampling and testing

Analysis Report

Report number : 13201/00032851.1/L/22 Date of sampling : 2022-05-01
Main Object : MINERA MONTHLY SAMPLING & TESTING - April 2022 Place of sampling : Minera Panama
Report Date : 2022-05-05 Date received : 2022-05-04
Date of issue : 2022-05-05 Date completed : 2022-05-05
Sample object : CSA Sample number : 13134069
Sample type : Sampled
Sample submitted as : Diesel (ULSD)
Marked : Shore tank CSA - dispensing point

NAME	METHOD	UNIT	SPECS		RESULT
			Min	Max	
Gravity API at 60 °F	Q ASTM D 4052	°API	32.0		36.8
Density at 15 °C	Q ASTM D 4052	kg/m³			840.6
Free Water and Particulate Contamination	ASTM D 4176				
Clear and Bright (procedure 1)		-		B&C	B&C/Pass
Test Temperature		°C			25.0
Color ASTM	Q ASTM D 1500	-		2.5	<0.5
Water and Sediment	Q ASTM D 2709	vol %		0.05	<0.01
Flash point (PM) procedure A	Q ASTM D 93	°C	60		62.0
Sulphur (S)	Q ASTM D 5453	mg/kg		15	3.8
Ash Content	Q ASTM D 482	mass %		0.01	<0.010
Micro Carbon Residue (10% bot.)	Q ASTM D 4530 / D 86	mass %		0.30	<0.10
Copper Strip Corrosion (3 hrs / 50 °C)	Q ASTM D 130	-		2	1 a
Kinematic Viscosity at 40 °C	Q ASTM D 445	mm²/s	1.9	4.1	2.674
Cetane Index	Q ASTM D 976	-	45		50.1
Distillation	Q ASTM D 86				
10% Recovered		°C		Report	206.7
50% Recovered		°C		Report	265.9
90% Recovered		°C	282	338	324.3
Final boiling point		°C		Report	347.1
Residue		vol %		2	1.7
Loss		vol %		2	0.7
Lubricity Test at 60 °C (Wear Scar Diameter)	ASTM D 6079	µm		520	450
Conductivity at 25 °C	Q ASTM D 2624	pS/m	25		200

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Attention of : Ms. R. Rodriguez
Your reference : Monthly Inventory - April 2022 - Sampling and testing

Analysis Report

Report number : 13201/00032851.1/L/22 Date of sampling : 2022-05-01
Main Object : MINERA MONTHLY SAMPLING & TESTING - April 2022 Place of sampling : Minera Panama
Report Date : 2022-05-05 Date received : 2022-05-04
Date of issue : 2022-05-05 Date completed : 2022-05-05
Sample object : CSA Sample number : 13134069
Sample type : Sampled
Sample submitted as : Diesel (ULSD)
Marked : Shore tank CSA - dispensing point

NAME	METHOD	UNIT	SPECS		RESULT
			Min	Max	
Biodiesel	ASTM D 7371	vol %		0.1	<0.10

Lab comments:
Q: CNA Accreditation LE-002 is applicable for tests followed with a Q

Signed by: Everner Jimenez - Laboratory Manager
Issued by: Core Laboratories Panama, S.A.
Place and date of issue: Panama City - 2022-05-05

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Attention of : Ms. R. Rodriguez
Your reference : Monthly Inventory - April 2022 - Sampling and testing

Analysis Report

Report number : 13201/00032851.2/L/22 Date of sampling : 2022-05-01
Main Object : MINERA MONTHLY SAMPLING & TESTING - April 2022 Place of sampling : Minera Panama
Report Date : 2022-05-05 Date received : 2022-05-04
Date of issue : 2022-05-05 Date completed : 2022-05-05
Sample object : EMULSION Sample number : 13134073
Sample type : Sampled
Sample submitted as : Diesel (ULSD)
Marked : Shore tank emulsion - dispensing point

NAME	METHOD	UNIT	SPECS		RESULT
			Min	Max	
Gravity API at 60 °F	Q ASTM D 4052	°API	32.0		36.6
Density at 15 °C	Q ASTM D 4052	kg/m³			841.1
Free Water and Particulate Contamination	ASTM D 4176				
Clear and Bright (procedure 1)		-		B&C	B&C
Test Temperature		°C			25.0
Color ASTM	Q ASTM D 1500	-		2.5	<0.5
Water and Sediment	Q ASTM D 2709	vol %		0.05	<0.01
Flash point (PM) procedure A	Q ASTM D 93	°C	60		63.0
Sulphur (S)	Q ASTM D 5453	mg/kg		15	4.1
Ash Content	Q ASTM D 482	mass %		0.01	<0.010
Micro Carbon Residue (10% bot.)	Q ASTM D 4530 / D 86	mass %		0.30	<0.10
Copper Strip Corrosion (3 hrs / 50 °C)	Q ASTM D 130	-		2	1 a
Kinematic Viscosity at 40 °C	Q ASTM D 445	mm²/s	1.9	4.1	2.692
Cetane Index	Q ASTM D 976	-	45		49.8
Distillation	Q ASTM D 86				
10% Recovered		°C		Report	208.2
50% Recovered		°C		Report	266.4
90% Recovered		°C	282	338	325.4
Final boiling point		°C		Report	347.7
Residue		vol %		2	1.7
Loss		vol %		2	1.3
Lubricity Test at 60 °C (Wear Scar Diameter)	ASTM D 6079	µm		520	460
Conductivity at 25 °C	Q ASTM D 2624	pS/m	25		200

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Analysis Report

Report number : 13201/00032851.2/L/22 Date of sampling : 2022-05-01
Main Object : MINERA MONTHLY SAMPLING & TESTING - April 2022 Place of sampling : Minera Panama
Report Date : 2022-05-05 Date received : 2022-05-04
Date of issue : 2022-05-05 Date completed : 2022-05-05
Sample object : EMULSION Sample number : 13134073
Sample type : Sampled
Sample submitted as : Diesel (ULSD)
Marked : Shore tank emulsion - dispensing point

NAME	METHOD	UNIT	SPECS		RESULT
			Min	Max	
Biodiesel	ASTM D 7371	vol %		0.1	<0.10

Lab comments:
Q: CNA Accreditation LE-002 is applicable for tests followed with a Q

Signed by: Everner Jimenez - Laboratory Manager
Issued by: Core Laboratories Panama, S.A.
Place and date of issue: Panama City - 2022-05-05

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Attention of : Ms. R. Rodriguez
Your reference : Monthly Inventory - April 2022 - Sampling and testing

Analysis Report

Report number : 13201/00032851.5/L/22 Date of sampling : 2022-05-01
Main Object : MINERA MONTHLY SAMPLING & TESTING - April 2022 Place of sampling : Minera Panama
Report Date : 2022-05-06 Date received : 2022-05-04
Date of issue : 2022-05-06 Date completed : 2022-05-06
Sample object : MSA Sample number : 13134067
Sample type : Sampled
Sample submitted as : Diesel (ULSD)
Marked : Shore tank MSA - dispensing point

NAME	METHOD	UNIT	SPECS		RESULT
			Min	Max	
Gravity API at 60 °F	Q ASTM D 4052	°API	32.0		36.3
Density at 15 °C	Q ASTM D 4052	kg/m³			843.0
Free Water and Particulate Contamination	ASTM D 4176				
Clear and Bright (procedure 1)		-		B&C	B&C
Test Temperature		°C			25.0
Color ASTM	Q ASTM D 1500	-		2.5	0.5
Water and Sediment	Q ASTM D 2709	vol %		0.05	<0.01
Flash point (PM) procedure A	Q ASTM D 93	°C	60		61.0
Sulphur (S)	Q ASTM D 5453	mg/kg		15	7.4
Ash Content	Q ASTM D 482	mass %		0.01	<0.010
Micro Carbon Residue (10% bot.)	Q ASTM D 4530 / D 86	mass %		0.30	<0.10
Copper Strip Corrosion (3 hrs / 50 °C)	Q ASTM D 130	-		2	1 a
Kinematic Viscosity at 40 °C	Q ASTM D 445	mm²/s	1.9	4.1	2.757
Cetane Index	Q ASTM D 976	-	45		49.3
Distillation	Q ASTM D 86				
10% Recovered		°C		Report	210.1
50% Recovered		°C		Report	266.3
90% Recovered		°C	282	338	324.6
Final boiling point		°C		Report	349.2
Residue		vol %		2	1.8
Loss		vol %		2	0.6
Lubricity Test at 60 °C (Wear Scar Diameter)	ASTM D 6079	µm		520	480
Conductivity at 25 °C	Q ASTM D 2624	pS/m	25		364
Biodiesel	ASTM D 7371	vol %		0.1	<0.10
Particle Count	ISO 4406				
>= 4 microns		pop/1mL			4400.63
>= 6 microns		pop/1mL			500.97
>= 14 microns		pop/1mL			45.70

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Analysis Report

Report number : 13201/00032851.5/L/22 Date of sampling : 2022-05-01
Main Object : MINERA MONTHLY SAMPLING & TESTING - April 2022 Place of sampling : Minera Panama
Report Date : 2022-05-06 Date received : 2022-05-04
Date of issue : 2022-05-06 Date completed : 2022-05-06
Sample object : MSA Sample number : 13134067
Sample type : Sampled
Sample submitted as : Diesel (ULSD)
Marked : Shore tank MSA - dispensing point

NAME	METHOD	UNIT	SPECS		RESULT
			Min	Max	
Contaminant code		-			19/16/13

Lab comments:
Q: CNA Accreditation LE-002 is applicable for tests followed with a Q

Signed by: Everner Jimenez - Laboratory Manager
Issued by: Core Laboratories Panama, S.A.
Place and date of issue: Panama City - 2022-05-06

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Attention of : Ms. R. Rodriguez
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Analysis Report

Report number : 13201/00032851.3/L/22 Date of sampling : 2022-04-30
Main Object : MINERA MONTHLY SAMPLING & TESTING - April 2022 Place of sampling : Minera Panama
Report Date : 2022-05-05 Date received : 2022-05-04
Date of issue : 2022-05-05 Date completed : 2022-05-05
Sample object : PRITT Sample number : 13134075
Sample type : Sampled
Sample submitted as : Diesel (ULSD)
Marked : Shore tank PRITT - dispensing point

NAME	METHOD	UNIT	SPECS		RESULT
			Min	Max	
Gravity API at 60 °F	Q ASTM D 4052	°API	32.0		37.0
Density at 15 °C	Q ASTM D 4052	kg/m³			839.4
Free Water and Particulate Contamination	ASTM D 4176				
Clear and Bright (procedure 1)		-		B&C	B&C/Pass
Test Temperature		°C			25.0
Color ASTM	Q ASTM D 1500	-		2.5	0.5
Water and Sediment	Q ASTM D 2709	vol %		0.05	<0.01
Flash point (PM) procedure A	Q ASTM D 93	°C	60		63.0
Sulphur (S)	Q ASTM D 5453	mg/kg		15	3.5
Ash Content	Q ASTM D 482	mass %		0.01	<0.010
Micro Carbon Residue (10% bot.)	Q ASTM D 4530 / D 86	mass %		0.30	<0.10
Copper Strip Corrosion (3 hrs / 50 °C)	Q ASTM D 130	-		2	1 a
Kinematic Viscosity at 40 °C	Q ASTM D 445	mm²/s	1.9	4.1	2.681
Cetane Index	Q ASTM D 976	-	45		50.4
Distillation	Q ASTM D 86				
10% Recovered		°C		Report	207.9
50% Recovered		°C		Report	265.9
90% Recovered		°C	282	338	323.2
Final boiling point		°C		Report	347.2
Residue		vol %		2	1.3
Loss		vol %		2	0.4
Lubricity Test at 60 °C (Wear Scar Diameter)	ASTM D 6079	µm		520	460
Conductivity at 25 °C	Q ASTM D 2624	pS/m	25		193

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Analysis Report

Report number : 13201/00032851.3/L/22 Date of sampling : 2022-04-30
Main Object : MINERA MONTHLY SAMPLING & TESTING - April 2022 Place of sampling : Minera Panama
Report Date : 2022-05-05 Date received : 2022-05-04
Date of issue : 2022-05-05 Date completed : 2022-05-05
Sample object : PRITT Sample number : 13134075
Sample type : Sampled
Sample submitted as : Diesel (ULSD)
Marked : Shore tank PRITT - dispensing point

NAME	METHOD	UNIT	SPECS		RESULT
			Min	Max	
Biodiesel	ASTM D 7371	vol %		0.1	<0.10

Lab comments:
Q: CNA Accreditation LE-002 is applicable for tests followed with a Q

Signed by: Everner Jimenez - Laboratory Manager
Issued by: Core Laboratories Panama, S.A.
Place and date of issue: Panama City - 2022-05-05

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Attention of : Ms. R. Rodriguez
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Analysis Report

Report number : 13201/00032851.4/L/22 Date of sampling : 2022-04-30
Main Object : MINERA MONTHLY SAMPLING & TESTING - April 2022 Place of sampling : Minera Panama
Report Date : 2022-05-06 Date received : 2022-05-04
Date of issue : 2022-05-06 Date completed : 2022-05-05
Sample object : TMF Sample number : 13134076
Sample type : Sampled
Sample submitted as : Diesel (ULSD)
Marked : Shore tank TMF - dispensing point

NAME	METHOD	UNIT	SPECS		RESULT
			Min	Max	
Gravity API at 60 °F	Q ASTM D 4052	°API	32.0		36.6
Density at 15 °C	Q ASTM D 4052	kg/m³			841.1
Free Water and Particulate Contamination	ASTM D 4176				
Clear and Bright (procedure 1)		-		B&C	B&C/Pass
Test Temperature		°C			25.0
Color ASTM	Q ASTM D 1500	-		2.5	<0.5
Water and Sediment	Q ASTM D 2709	vol %		0.05	<0.01
Flash point (PM) procedure A	Q ASTM D 93	°C	60		63.0
Sulphur (S)	Q ASTM D 5453	mg/kg		15	4.8
Ash Content	Q ASTM D 482	mass %		0.01	<0.010
Micro Carbon Residue (10% bot.)	Q ASTM D 4530 / D 86	mass %		0.30	<0.10
Copper Strip Corrosion (3 hrs / 50 °C)	Q ASTM D 130	-		2	1 a
Kinematic Viscosity at 40 °C	Q ASTM D 445	mm²/s	1.9	4.1	2.727
Cetane Index	Q ASTM D 976	-	45		49.6
Distillation	Q ASTM D 86				
10% Recovered		°C		Report	208.1
50% Recovered		°C		Report	265.5
90% Recovered		°C	282	338	322.6
Final boiling point		°C		Report	347.1
Residue		vol %		2	1.2
Loss		vol %		2	0.4
Lubricity Test at 60 °C (Wear Scar Diameter)	ASTM D 6079	µm		520	490
Conductivity at 25 °C	Q ASTM D 2624	pS/m	25		218

All results in this report refer to the sample(s) tested as taken or submitted like specified in this Analysis report. Uncertainties, available on request, apply in the evaluation of the test results. All tests are conducted according to the latest version of the methods, unless another version is specifically indicated. Where available and for convenience purposes, the tested sample has been checked for compliance with supplied specifications, without accepting any liability. In case of dispute or concern, we refer to the interpretation of test results as defined in ASTM D3244, IP 367, ISO 4259 or GOST 33701. This report shall not be partially copied and reproduced without the written permission of the laboratory.

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Attention of : Ms. R. Rodriguez
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Analysis Report

Report number : 13201/00032851.4/L/22 Date of sampling : 2022-04-30
Main Object : MINERA MONTHLY SAMPLING & TESTING - April 2022 Place of sampling : Minera Panama
Report Date : 2022-05-06 Date received : 2022-05-04
Date of issue : 2022-05-06 Date completed : 2022-05-05
Sample object : TMF Sample number : 13134076
Sample type : Sampled
Sample submitted as : Diesel (ULSD)
Marked : Shore tank TMF - dispensing point

NAME	METHOD	UNIT	SPECS		RESULT
			Min	Max	
Biodiesel	ASTM D 7371	vol %		0.1	<0.10

Lab comments:
Q: CNA Accreditation LE-002 is applicable for tests followed with a Q

Signed by: Everner Jimenez - Laboratory Manager
Issued by: Core Laboratories Panama, S.A.
Place and date of issue: Panama City - 2022-05-06

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